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THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

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# THE ENTRY AND MOVEMENT OF ELM BURL LOGS

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The Dutch elm disease was discovered in the United States in 1930. The first clue as to how it entered the country came in August 1933 when port inspectors of the Bureau of Entomology and Plant Quarantine found that European elm burl logs for use in cutting fancy veneer were entering the United States. Upon investigation Ceratostomella ulmi was definitely determined to be present in such logs intercepted at New York, Baltimore, Norfolk, and New Orleans. A quarantine on the entry of elm burl logs from Europe was established October 21, 1933, and all previous entries of such logs have been traced.

The United States Treasury and United States Commerce Departments maintain jointly a system or import records setting forth the materials which come to the United States from abroad. Reports are made by collectors of customs. These are assembled and tabulated by the Section of Customs Statistics of the Department of Commerce. This section is located in New York City. The data are analyzed and organized on the basis of the current tariff act and not necessarily by individual commodities. Elm logs are not segregated as such but are included in the classification item "Cabinet Woods in the log form

not specifically provided for." The port of entry, the country from which shipped, the customs entry number, and the classification item are all entered in the Customs Statistics records in the form of key numbers. These records are available in complete form back through the calendar year 1925 and in partial form through 1923. With the cooperation of the Section of Customs Statistics, all these records have been examined and the entry numbers extracted. To determine which of these entries include elm burl logs and which apply to other logs under the same tariff heading required an examination of the appropriate customs entry papers on file at the customs port of entry.

The Customs port of entry recorded for a log shipment is not necessarily the port at which the logs make their first arrival in the United States but is the port where the duty is paid and they are cleared from customs. More than half of the elm burl logs arrived at one of the four maritime ports above-mentioned and were transferred under customs bond to some port of entry in the interior of the United States before being released from Customs. For such logs an entry for Immediate Transportation in Bond was made at the port of first arrival and this entry is unaccompanied by the detailed customs papers, which show the nature of the contents of the shipment. Such papers are to be found at the final customs port of entry. The period during which these final entry papers are preserved differs at the different ports but is never less than five years and is frequently much longer.

In addition, information has been obtained by interviewing a large number of veneer manufacturers and log dealers interested in, or thought likely to be interested in, the importation of elm burl logs.

The Customs records show that elm burl logs have been brought to the United States from France, England, and Germany. An importer's statement makes it probable that one shipment had its real origin in Czechoslovakia.

The earliest importation discovered was in 1925 and shipments have been recorded in each succeeding year.

New York, Baltimore, Norfolk, and New Orleans are the only ports of arrival found. Special attention was given to Boston because of the importance of New England in the Dutch elm disease control problem. There is no evidence that any elm burl logs have entered Boston or any other New England port nor is there any evidence of any shipment of logs from other ports to New England. A Boston veneer manufacturer states that the cutting of fancy elm burl veneer occurs chiefly in the Middle West and that New England manufacturers have not yet become interested in it.

The Customs records or manufacturer's statements show that elm burl logs have gone to veneer factories or to log yards in New York City, N. Y., Carteret, N. J., Baltimore, Md., Portsmouth, Va., Cincinnati, Dayton and Piqua, Ohio, Laurenceburg, Indianapolis, and Evansville, Ind., Chicago, Ill., Louisville, Ky., Knoxville, Tenn., Kansas City, Mo., and Harahan and Slidell just outside of New Orleans, La.

From the ports of arrival log shipments moved, usually by railroad, to veneer mills as listed below. Logs which were hot water treated at the port of arrival have not been included.

## From New York City Piers and Log Yards

From Customs Records

1 shipment over the New York Central to Chicago, Ill.
1 shipment over the Pennsylvania Ry. to Indianapolis, Ind.
4 shipments over the Baltimore and Ohio to Indianapolis, Ind.
5 shipments over the Baltimore and Ohio to Cincinnati, Ohio.
1 shipment over the Baltimore and Ohio to Dayton, Ohio.
1 shipment over the New York Central and Baltimore and Ohio to Piqua, Ohio.

Reported Sales from New York log yards but route unknown

1 shipment to Cockeysville, Md.
1 shipment to Cincinnati, Ohio.
3 shipments to Indianapolis, Ind.
2 shipments to Knoxville, Tenn.
1 shipment to Evansville, Ind.
1 shipment (by truck) to Carteret, N. J.

## From Baltimore Piers

3 shipments over the Pennsylvania to Indianapolis, Ind.
2 shipments over the Baltimore and Ohio to Indianapolis, Ind.
1 shipment over an unknown route to Indianapolis, Ind.
1 shipment over the Canton Ry. and the Baltimore and Ohio to Louisville, Ky.
1 shipment over the Pennsylvania to Cincinnati, Ohio.
3 shipments over the Baltimore & Ohio to Cincinnati, Ohio.
1 shipment over the Western Maryland and Baltimore and Ohio to Cincinnati, Ohio.
1 shipment over the Baltimore and Ohio to Laurenceburg, Ind.
1 shipment by unknown route to Kansas City, Mo.

## From New Orleans Piers

1 shipment over the Illinois Central to Chicago, Ill.
1 shipment over the Illinois Central to Indianapolis, Ind.
2 shipments over the Louisville and Nashville to Louisville, Ky.
3 shipments over the Illinois Central and Baltimore and Ohio to Cincinnati, Ohio.
3 shipments over the Louisville and Nashville to Knoxville, Tenn.
1 shipment over the Southern Ry. to Knoxville, Tenn.
1 shipment probably by truck to Harahan, La.
1 shipment probably by truck to Slidell, La.
1 shipment probably by truck either to Harahan or Slidell, La.

From Norfolk Piers

1 shipment over the Norfolk and Western and Pennsylvania Ry. to Indianapolis, Ind.
7 shipments by truck to Portsmouth, Va.

With these log movements the present known distribution of the Dutch elm disease may be compared. Over 7,600 infected trees are known in the vicinity of New York City. One tree has been found at Baltimore; one at Norfolk; ten at Cleveland; one at Cincinnati; and four at Indianapolis. All these are closely related to the log movements. One infected tree has been found at Old Lyme, Connecticut many miles east of the New York City infected area. Apparently, its presence is not related to imported logs.

## FIGHT AGAINST DUTCH ELM DISEASE IN FULL SWING IN THREE STATES

The enlarged Federal campaign to save the American elm from the fate of the American chestnut is now in full swing against the Dutch elm disease. The war is being waged over 5,000 square miles in New York, New Jersey, and Connecticut; all within a radius of 50 miles of the port of New York City where the disease entered this country. Nearly 7,700 Dutch elm disease trees and 30,000 deadand dying or unsanitary elms have been chopped down and promptly burned. The sanitation program was made possible by an allocation of funds from the Public Works Administration and of men from the Civilian Conservation Corps. A total of 142 crews, 68 in New York, 44 in New Jersey and 30 in Connecticut, are now attacking the 175,000 dead and dying elms which may be possible sources of the disease as well as breeding places for insect carriers of the disease. (From U.S.D.A. Press Release, February 11)

## CYTOSPORINA CANKER ON AMERICAN ELM IN ILLINOIS NURSERIES

J. C. Carter

Diseases of elms in Illinois nurseries have been closely observed by members of the Illinois State Natural History Survey staff over a period extending from September 1930 to the present time and several genera of fungi have been found associated with cankerous diseases. Cytosporina, however, was found for the first time in the summer of 1934, when it appeared very suddenly and was soon abundant.

Among fungi secured from diseased elms by isolation, Coniothyrium and Phoma are encountered most often. Their relative abundance, as indicated by isolations during four years, appears in Table 1, by which it is shown that Coniothyrium constituted 27.5 per cent and Phoma 13.2 per cent of all isolations and that the two together amounted to 40.7 per cent of all isolations. In 1931 and again in 1934 Coniothyrium was obtained more frequently than Phoma; but in 1933 Phoma appeared to be more prevalent than Coniothyrium, 26.2 per cent of the isolations made that year being Phoma and only 17.4 per cent Coniothyrium.

Table 1. Percentage of Coniothyrium and Phoma isolations in comparison to total isolations from elms in Illinois, 1930-1934

| Year | Coniothyrium % | Phoma % | Total % of all isolations |
|---|---|---|---|
| Sept. 1930 to Dec. 1931 | 34.3 | 13.6 | 47.9 |
| 1932 | 12.5 | 12.5 | 25.0 |
| 1933 | 17.4 | 26.2 | 43.6 |
| 1934 | 21.8 | 11.5 | 33.3 |
| Ave. % 1930-1934 | 27.5 | 13.2 | 40.7 |

On July 26, 1934, a Cytosporina, assigned for the present to the species C. ludibunda Sacc. by ourselves and W. W. Diehl, was found fruiting on diseased American elm trees. This Cytosporina made its appearance very suddenly in late July and early August. It has been found once previously on American elm in Illinois by Dow V. Baxter, but not to our knowledge on nursery elm stock. Seymour, in his "Host Index" does not list it on elm in North America, while Saccardo, in the "Sylloge Fungorum" gives Ulmus as a host but does not include North America in its range.

After the appearance of the Cytosporina, we made counts of all cankers, regardless of cause, that occurred in three different and widely separated plots of American elm in nurseries. They were sorted according to the fungus which was present on them. Table 2 shows the abundance of Cytosporina and Phoma cankers in this count.

Table 2. Prevalance of Cytosporina and Phoma cankers in three plots of American elms in Illinois nurseries in 1934

| Plot Number | Total No. of Cankers | Cytosporina ludibunda: No. of Cankers | % | Phoma: No. of Cankers | % | Cause Undetermined: No. of Cankers | % |
|---|---|---|---|---|---|---|---|
| I | 32 | 10 | 31.25 | 0 | 0.00 | 22 | 68.75 |
| II | 30 | 4 | 13.33 | 4 | 13.33 | 22 | 73.34 |
| III | 43 | 12 | 27.91 | 10 | 23.25 | 21 | 48.84 |
| Total & Average | 105 | 26 | 24.76 | 14 | 13.34 | 65 | 61.90 |

These data indicate that, though not present in previous years, the Cytosporina canker became in the single season of 1934 so abundant as to exceed the actual prevalence of Phoma cankers and the prevalence of Coniothyrium cankers as indicated by isolation tests.

Further work is under way with the Cytosporina canker. (Section of Applied Botany and Plant Pathology, Illinois State Natural History Survey)

## CANKERS OF HARDWOODS

(Statement prepared by Emergency Conservation Work Technicians and by members of the Division of Forest Pathology)

Nectria Canker: Practically all hardwood species are attacked by the Nectria canker. The species most commonly infected by regions are:

Northeast -- Sweet and yellow birch (Betula lenta and B. lutea), beech (Fagus americana), and red, mountain, hard, and striped maple (Acer rubrum, A. spicatum, A. saccharum, A. pennsylvanicum), fire cherry (Prunus pennsylvanica), basswood (Tilia americana), and aspen (Populus tremuloides).

Allegheny -- Oaks (especially white), red maple, black walnut (Juglans nigra), fire cherry, aspen, and basswood.

Appalachian -- Yellow poplar (Liriodendron tulifera), black walnut, sassafras (Sassafras variifolium), fire cherry, mountain magnolia (Magnolia acuminata), sweet and yellow birch, and the oaks to a limited extent. Damage in this region is limited largely to yellow poplar and black walnut.

Heavily cankered stands usually occur in scattered patches. Sometimes nearly all of the hardwood species within a diseased area are heavily attacked and sometimes only one or two species. There is a great difference between tree species in their susceptibility and reaction to canker development. Differences are evident also between individuals of the same species and between different parts of the same tree. Oaks seem to remain relatively free of cankers, at least severe infections, unless they become infected within the first 20 to 30 years. Birches, on the other hand, are subject to cankering in certain parts of the tree for a good portion of their life. With yellow poplar there is a definite relation between reduced vigor of the tree and canker damage. While there is some evidence that poor growth and inferior sites favor canker development in other species, this relation is usually not as definite as with the yellow poplar.

It appears that there are several different strains of Nectria which are associated with the cankers on the above hardwoods.

Strumella Canker: The range of importance of Strumella canker is from Canada south through the mountain region to southern Virginia. Dr. Bramble recently reported it from Minnesota. It is prevalent enough in certain stands to be damaging in Pennsylvania, Connecticut, New York, New Jersey, and Maryland, and occasionally in Massachusetts, West Virginia and Virginia.

Strumella is important primarily on red, black, white, and scarlet oaks but occurs to a limited extent on a number of other oaks (Quercus spp.), hickories (Hicoria spp.), ironwood (Ostrya virginiana), red maple, black gum (Nyssa sylvatica), chestnut (Castonea dentata), and beech. As with Nectria, heavily cankered stands usually occur in scattered patches, although the disease seldom reaches the epidemic proportions that Nectria does in certain stands.

## THE ATROPELLIS CANKER OF EASTERN PINES

J. D. Diller

In 1932 a pine canker was found killing branches, principally on Scotch pine in the Shawnee State Forest in Ohio. A study of the material indicated that it was closely related to the twig canker of western pine described by Zeller and Goodding from the Pacific northwest, as caused by the fungus Atropellis pinicola. They found it on western white, sugar, and lodge-pole pines.

It was also learned that the eastern disease had been collected by Overholts and Jackson on twigs of native pitch and on Scotch pine, and that it had been found by Boyce to be rather common as a twig and branch girdler in certain Scotch and Norway pine plantations in Massachusetts and New Hampshire.

While the fungus associated with the eastern disease is closely related to the one described by Zeller and Goodding, it does not seem to be identical.

The disease is widely distributed from the New England and Lake States to the Gulf States, and from the Atlantic coast to eastern Texas and Oklahoma. Its origin is uncertain. It may be a native disease or it may be one of foreign introduction which has been in the United States for a good many years. Its appearance on practically all native pine species of eastern United States and on many exotic species, together with the discovery of old cankers throughout most of the range indicate that it is native, but in contradiction to this the rapid increase of the disease in recent years on certain American species of pine indicates an introduction brought here several decades ago which is becoming epidemic in certain localities. For instance, in a young, fast growing stand of native slash pine (800 trees per acre, nine years old with an average diameter of 3.6 inches and average height of 22 feet) 87 per cent of the trees were infected and 29 per cent of the branches were killed as a result of the disease.

The status of this disease, and its possible importance beyong killing twigs and branches and malforming main-stems is being worked out.

## SOME DISEASES OF ORNAMENTALS IN OREGON

F. P. McWhorter

Heterosporium leaf spot of Iris: During 1934 many acres of bulbous iris varieties, especially Wedgewood, The First, and David Bless were defoliated by Heterosporium gracile. The Didymellina stage has not been demonstrated on bulbous iris but direct inoculations from typical German iris leaf spot isolations have proved the fungus to be identical on both. Field observations have shown that the fungus has overwintered on rogues in formerly infected plantings. At this time, January 29, the first specimens are being sent in from commercial fields. The disease is only important from a propagation viewpoint, but under Northwest conditions, now that mosaic has been largely eliminated, the leaf spot is the most important disease with which iris growers have to contend.

Calla Lily Mosaic: Through the kindness of Inspector J. S. Weiman of the State Inspection Service, we have received a specimen of Zantedeschia aethiopica diseased with what he calls a "mosaic." The plant sent us exhibits every evidence of a virus disease of the mosaic type. The depigmentation suggests the condition which prevails in a severely diseased Phytolacca decandra. The younger leaves and shoots are progressively more chlorotic, presenting unmistakable evidences of a virus disease. Mr. Weiman reports that 20 per cent of the plants in the Portland greenhouse are affected.

Phomopsis canker on Holly: Since 1929 frequent complaints from holly growers have been received at Oregon State College. These letters or specimens described or illustrated a "brown" canker which affected both large and small trees. In 1933 a case was reported from near Astoria where over a thousand trees in a young nursery died from the canker. Specimens have been sent in over a period of years but none had possessed mycological significance until the fall of 1934. At that time typical cankers were received from a point near Newberg, Oregon; in these cankers, in positions pointing to definite etiological significance, were found pycnidia of a fungus which we have determined to be Phomopsis crustosa (Sacc.) Bomm. & Rouss. On January 24, 1935 the writer examined a large holly tree in Astoria that had been defoliated by the brown canker. Selected material from the tree showed in addition to the Phomopsis, a Diaporthe that seemed to be Diaporthe eres Nitschke. The spores are rather large but the species is variable and it is not surprising to find exceptionally large spores in the humid conditions of the Oregon coast.

The canker, which is of uudoubted economic importance, manifests itself as a brown canker of the girdling type. On young green twigs it develops as a bright brown surface spot which soon becomes sunken. On old stems the lesions are deeply sunken, and of a darker color. The largest we have seen measure six centimeters in length and extend almost entirely around the stems. As stated above, fruiting of the fungus is seldom evidenced. Inoculation tests with both Phomopsis and Diaporthe isolations are in progress. (Oregon State Agr. Coll.)

## NOTES ON SOME DISEASES OF RYE GRASSES IN WESTERN OREGON

Roderick Sprague

The most conspicuous and most common disease of English rye grass (Lolium perenne) and of western Italian rye grass (Lolium multiflorum), particularly of the latter, is a dark brown leaf and sheath spot caused by a species of Ascochyta. It reduces the foliage area on western rye grass about 20 per cent during the winter and spring months at Corvallis and frequently kills the plant to the crown.

In some cases a species of Phytophthora is associated with the brown leaf spots and during mild mid-winter periods causes an independent agressive leaf rot on both species of Lolium.

The pale-spored Helminthosporium siccans Drechs. is common on L. perenne at Corvallis but is seldom destructive.

Scolecotrichum graminis Fckl. is the cause of a very destructive leaf spot on some grasses in western Oregon but does very little damage to the rye grasses which seem to be resistant to it.

Ovularia lolii Volkart causes a light colored red bordered spot or eye-spot on the leaves and sheaths of L. perenne in Benton County. It is more widespread than the Scolecotrichum leaf spot but is of minor importance.

Darluca filum occurs as a parasite of Puccinia coronata on L. multiflorum at Corvallis. This fungus seems to be the same as Ascochyta graminicola var ciliolata Sacc.

Septoria sp. is sometimes found on both species of Lolium in Linn and Benton Counties.

The following fungi are either saprophytes or very weak parasites on Lolium spp. in western Oregon: Heterosporium sp., Titea spp., Cladosporium spp., and Helminthosporium sativum (dark brown pip-shaped spores seen in one instance). (Division of Cereal Crops and Diseases)

## CORRECTIONS

The following corrections should be made in Supplement 86, Diseases of Plants in 1933:

On page 89, under Rhododendron spp., the host of Colletotrichum philodendri should be Philodendron giganteum instead of Rhododendron giganteum.

Also on page 89, under Rosa spp., the cause of crown canker should be Cylindrocladium scoparium, not Cylindrosporium

On page 62, cotton anthracnose was reported as causing a loss of 5 per cent and maximum losses of about 70 per cent in Arkansas. These losses were caused by Fusarium wilt, instead of anthracnose, which is a disease of minor importance in Arkansas.